

amples were taken, in the month of April, upon the abdominal feet of *Callinassa*.

3. *Hersilioides Puffini*, Thomson (*Cyclops Puffini*, J. C. Thoms., Proc. Biol. Soc. Liverp. vol. ii. 1887).—*Comptes Rendus*, November 12, 1888, p. 792.

*Pebrilla*, a new Genus of Infusoria living on the Hermit-crab.

By Prof. A. GIARD.

Prof. Giard, at the close of a notice of the species of *Folliculina* observed on the French coasts, gives a short description of a new form allied to that genus which he proposes to name *Pebrilla paguri*. He has found this Infusorian on the abdomen of hermit-crabs (*Eupagurus Bernhardus*) infested by *Peltogaster paguri* and *Phryxus paguri*, but does not doubt that it may also exist upon healthy subjects. It forms small colonies placed either in the vicinity of the feet or at the posterior extremity of the abdomen of the hermit-crab. These colonies are visible by the naked eye as black patches, which retain their colour even after being long in spirits.

The capsule of *Pebrilla* is of an oblong-ovate form, with a projecting tubercle at the hinder extremity, within which the actual body of the Infusorian is attached; it is strongly constricted transversely in the middle, and the aperture is surrounded by a nearly erect or slightly everted collar. The lobes which surmount the mouth of the Infusorian are shorter than in the *Folliculinae*, and the nucleus is very large and moniliform. It is not uncommon to find individuals in a state of bipartition or of gemmiparous reproduction.

*Pebrilla paguri*, like the *Phryxus* and *Peltogaster*, evidently avails itself of the currents of water which circulate along the abdomen of the hermit-crab, and it forms an interesting addition to the long list of commensals of that Crustacean. The specimens on which it was found were collected at Pouliguen and Roseoff, those from the latter locality in 1872, and yet the Infusorians were so well preserved that their vibratile cilia and moniliform nucleus could be clearly seen.—*Bull. Sci. de la France et de la Belgique*, 1888, p. 316, pl. xx. figs. 1, 2.

*On the Nutrition of the Protozoa.* By Dr. M. MEISSNER.

Dr. Meissner in the first place refers to previous experiments in the feeding of Protozoa, as those made by Count Gleichen-Russwurm in the last century and continued at a later date by Ehrenberg. In both cases the inception of grains of carmine into the body-substance of Infusoria was observed.

The food of the Protozoa is well known to consist of low forms of

Algæ and Fungi and of smaller representatives of the Protozoan world itself. The larger forms even take in small Vermes (Rotatoria) as welcome prey. To ascertain what constituents of the incepted objects are *assimilated* by the Protozoa the animals were fed with the individual materials which enter into the composition of these objects. Starch, fat, and albumen are the chief constituents of the food of the Protozoa. The author has tried what changes these substances undergo in the plasma of the Rhizopoda and Infusoria.

He first of all fed *Amœbæ* with rice-starch by placing a fragment of the size of a pea in a small glass vessel containing vegetable débris, in which the presence of different Rhizopoda had been ascertained. In a few days the inception of the starch-grains could be recognized in several individuals. But these grains underwent absolutely no alteration, although many of them remained for more than a week in the *Amœbæ*.

Hence it appeared that starch-grains are not digested by *Amœbæ*. The author experimented with *Amœba princeps*, *A. radiosa*, *Pelomyxa palustris*, and *Actinophrys sol*.

In the oil-experiments olive-oil coloured with tincture of alkanet was employed. But it proved that this also remained quite undigested after it had been taken up by the animals in the form of very small globules.

Thus it could only be supposed that albumen is the principal nutriment of the Amœbiform organisms, and this supposition was confirmed by experiment. Although the *Amœbæ* are apparently unable to digest boiled albumen, observations upon the fate of the albumen of the Protista taken in showed that in this case a solution takes place. The protoplasm of the swallowed Protozoa, Algæ, and Fungi, after being liquefied, is taken up, or rather absorbed, by the sarcode of the Rhizopods, while the indigestible remains are thrown out.

With regard to the Infusoria Dr. Meissner arrived at very similar results. He made feeding-experiments with *Climacostomum virens*, *Vorticella nebulifera*, and *Peranema trichophorum*. From these it appeared that the Infusoria, when all other nourishment has been extracted, convert the incepted starch into a substance which, when treated with a solution of iodine, is coloured red (dextrine?), and which is afterwards dissolved in the body. Oil, on the other hand, remained quite unaltered, while vegetable and animal albumen was assimilated. Boiled albumen, however, remained unaltered, as in the Rhizopods.

How quickly the solution and assimilation of the albumen take place in many cases is shown by the observed digestion of a *Diffugia* by a *Climacostomum virens*, which only occupied twenty-five minutes. After this lapse of time the Rhizopod was completely digested, and its empty shell remained within a vacuole in the interior of the Infusorian.—*Zeitschr. für wiss. Zool.* Bd. xlv. ; Abstract by Dr. O. Zacharias in *Biol. Centralblatt*, 1888, p. 547.